

**REMARKS**

The Office Action dated June 15, 2004 presents the examination of claims 13, 16, 22, and 24-35. Claims 13, 16, 22, 24-27, 29, 32, and 35 are amended. Support for subject matter added to claims 13, 16, 22, and 35 is found in the specification, such as on page 10, lines 4-19, and page 62, lines 5-25 of the specification. The specification is amended to recite sequence identifying numbers originally made in the Preliminary Amendment filed on August 6, 1999. No new matter is inserted into the application.

***Specification (Paragraph 6 of the Office Action)***

The specification is objected to for inconsistencies in the sequence identifiers. In response to the Examiner's remarks, the specification is corrected to incorporate the changes made to the specification in the Preliminary Amendment of August 6, 1999. Thus, the instant objection is overcome.

***Rejection under 35 U.S.C. § 112, second paragraph (Paragraph 13 of the Office Action)***

The Examiner rejects claims 13, 16, 22, 24, 25, and 27-35 under 35 U.S.C. § 112, second paragraph, for allegedly being indefinite. Applicants respectfully traverse. Reconsideration of

the claims and withdrawal of the instant rejection are respectfully requested.

The Examiner asserts that the phrase "polypeptide having an activity of a receptor capable of binding to a murine PBSF/SDF-1" is indefinite, allegedly because there is no indication what activities (other than binding to murine PBSF/SDF-1, and acting as a binding site for T-cell-line-tropic HIV-1 env cell membrane fusion with a T-cell-line-tropic HIV-1) that the claimed polypeptides can perform. In order to overcome the rejection but not to acquiesce to the Examiner's position, the claims are amended to recite that the claimed polypeptide has the activity of a receptor capable of binding to a murine PBSF/SDF-1 and acts as a binding site for T-cell-line-tropic HIV-1 env cell membrane fusion with a T-cell-line-tropic HIV-1 in the presence of human CD4.

Applicants respectfully submit that the instant claims particularly point out and distinctly claim the subject matter which is the invention, such that the requirements of 35 U.S.C. § 112, second paragraph, are met. Withdrawal of the instant rejection is therefore respectfully requested.

***Rejection under 35 U.S.C. § 112, first paragraph (written description) (Paragraph 15 of the Office Action)***

The Examiner maintains the rejection of claims 16 and 22 and

newly rejects claims 13, 24-27, 29, 31-32, 34, and 35 under 35 U.S.C. § 112, first paragraph, for allegedly containing subject matter not described in the specification. Applicants respectfully traverse. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

The Examiner asserts that the specification does not indicate that SEQ ID NOS: 3 and 7 would be capable of performing any one of the activities of the whole receptor encoded by SEQ ID NO: 1. In order to overcome the rejection but not to acquiesce to the Examiner's position, SEQ ID NOS: 3 and 7 are deleted from the claims. As acknowledged by the Examiner, the polypeptide encoded by SEQ ID NO: 5 has been shown to have murine PBSF/SDF-1 binding activity.

The Examiner also asserts that the specification does not describe what activities (other than binding to murine PBSF/SDF-1, and acting as a binding site for T-cell-line-tropic HIV-1 env cell membrane fusion with a T-cell-line-tropic HIV-1) that the claimed polypeptides can perform. In order to overcome the rejection but not to acquiesce to the Examiner's position, the claims are amended to recite that the claimed polypeptide has the activity of a receptor capable of binding to a murine PBSF/SDF-1 and acts as a binding site for T-cell-line-tropic HIV-1 env cell membrane fusion with a T-cell-line-tropic HIV-1 in the presence of human CD4.

Applicants respectfully submit that the instant claims recite subject matter clearly described in the specification, such that the requirements of 35 U.S.C. § 112, first paragraph are met. Withdrawal of the instant rejection is therefore respectfully requested.

***Rejection under 35 U.S.C. § 112, first paragraph (enablement)***

*Paragraph 16 of the Office Action*

The Examiner rejects claims 13, 16, 22, 24-27, 29, 31-32, 34, and 35 under 35 U.S.C. § 112, first paragraph, for allegedly containing subject matter not enabled by the specification. Applicants respectfully traverse. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

The Examiner asserts that the specification does not indicate that SEQ ID NOS: 3 and 7 would be capable of performing any one of the activities of the whole receptor encoded by SEQ ID NO: 1. In order to overcome the rejection but not to acquiesce to the Examiner's position, SEQ ID NOS: 3 and 7 are deleted from the claims. As acknowledged by the Examiner, the polypeptide encoded by SEQ ID NO: 5 has been shown to have murine PBSF/SDF-1 binding activity. Thus, the instant rejection is overcome.

Paragraph 17 of the Office Action

The Examiner rejects claims 13<sup>1</sup>, 16, 22, 31, and 34-35 under 35 U.S.C. § 112, first paragraph, for allegedly reciting subject matter not enabled by the specification. Applicants respectfully traverse the rejection applied to the pending claims. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

The Examiner states that the rejection is based on the presupposition that a first nucleic acid that hybridizes to a second nucleic acid does not encode the same polypeptide as the second nucleic acid. In response to the Examiner's remarks, section (e) of claims 13, 16, and 22 is amended to recite that the claimed nucleic acid hybridizes under stringent conditions to the complementary nucleotide sequence of any one of the nucleotide sequences recited in sections (a) to (d) of the same claim. Thus, the instant rejection is overcome.

Paragraph 18 of the Office Action

The Examiner maintains in part the rejection of claim 22, further extends the rejection to claims 26, 32, and 34-35, under 35 U.S.C. § 112, first paragraph, for allegedly reciting subject matter not enabled by the specification. Applicants respectfully

---

<sup>1</sup> Claim 12 is included in the list of claims rejected in line 6 of paragraph 17. Applicants assume that the Examiner intended to reject claim 13, rather than claim 12, which was canceled in the Supplemental Reply filed on April 8, 2004.

traverse. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

Specifically, the Examiner asserts that the specification does not show that SEQ ID NOs: 3 and 7 would be capable of use in the claimed kit. In order to overcome the rejection but not to acquiesce to the Examiner's position, SEQ ID NOs: 3 and 7 are deleted from the claims. As acknowledged by the Examiner, the polypeptide encoded by SEQ ID NO: 5 has been shown to bind to PBSF/SDF-1. Thus, the instant rejection is overcome.

Paragraph 20 of the Office Action

The Examiner newly rejects claims 16, 25, 29, and 30 under 35 U.S.C. § 112, first paragraph, for allegedly reciting subject matter not enabled by the specification. Applicants respectfully traverse. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

The Examiner asserts that, while the specification is enabling for cells recombinantly expressing hCD4 and mCXCR-4 that may be infected with T-cell-line-tropic HIV, the specification does not enable any cell expressing hCD4 and mCXCR-4 which may be infected by any HIV. In order to overcome the rejection, but not to acquiesce to the Examiner's position, the last phrase of claim 16 is amended to recite that the recombinant cell is infected

with T-cell-line-tropic HIV-1. Thus, the instant rejection is overcome.

Paragraph 21 of the Office Action

The Examiner newly rejects claim 35 under 35 U.S.C. § 112, first paragraph, for allegedly reciting subject matter not enabled by the specification. Applicants respectfully traverse. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

The Examiner asserts that that specification does not enable recombinant cells expressing only CXCR-4, because the specification and art indicate that the presence of both CD4 and CXCR-4 are required for fusion or infection to occur. Claim 35, as amended, recites that cell membrane fusion and infection with T-cell-line-tropic HIV-1 occurs in the presence of human CD4. Thus, the instant rejection is overcome.

Conclusion

Applicants respectfully submit that the instant claims recite subject matter which is enabled by the specification, such that the requirements of 35 U.S.C. § 112, first paragraph are met. Withdrawal of the instant rejection is therefore respectfully requested.

**Rejection under 35 U.S.C. § 102(a) (Paragraphs 23-24 of the Office Action)**

Nagasawa et al.

The Examiner rejects claims 13, 16, 24-25, 27-30 and 35 under 35 U.S.C. § 102(a) for allegedly being anticipated by Nagasawa et al. (*PNAS* 93:14725-29, 1996). Applicants respectfully traverse. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

Nagasawa et al. discloses that murine T cells expressing human CD4 were refractory to HIV-1 infection both *in vitro* and *in vivo*. See, page 14,729, left column, lines 4-6 of Nagasawa et al. In contrast, the instant specification discloses that HIV-1 infects recombinant cells expressing murine CXCR4 together with human CD4. See, Example 7, pages 54-62 of the specification. Thus, the recombinant cells of the present invention differ from those of the prior art.

Nevertheless, the Examiner asserts that the recombinant cell of the present invention as defined in the claims is not distinguishable over the prior art. In order to clarify this difference, the term "comprising" in line 2 of claim 16 is amended to "expressing." Nagasawa et al. fails to disclose a recombinant cell expressing a human CD4 protein and a polypeptide which enables T-cell-line-tropic HIV-1 infection. As to claim 13, Nagasawa et al. fails to disclose the polypeptide which

enables T-cell-line-tropic HIV-1 infection by expression together with human CD4.

For these reasons, Nagasawa et al. fails to anticipate the present invention as recited in the claims. Withdrawal of the instant rejection is therefore respectfully requested.

Heesen et al. or Ashorn et al.

The Examiner rejects claims 13, 16, 24-25, 28, 30, and 35 under 35 U.S.C. § 102(a) for allegedly being anticipated by either Heesen et al. (*J. Immunol.* 157:5455-5460, 1996) or Ashorn et al. (*J. Virol.* 64(5): 2149-2156, 1990). Applicants respectfully traverse. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

Heesen et al. discloses the cloning of a murine homologue of CXCR-4. Ashorn et al. discloses cells expressing CD4/gp160 for the study of membrane fusion. In contrast, the instant specification discloses that HIV-1 infects recombinant cells expressing murine CXCR4 together with human CD4. See, Example 7, pages 54-62 of the specification. Thus, the recombinant cells of the present invention differ from those of the prior art.

Nevertheless, the Examiner asserts that the recombinant cell of the present invention as defined in the claims is not distinguishable over the prior art. In order to clarify this difference, the term "comprising" in line 2 of claim 16 is

amended to "expressing." Neither Heesen et al. nor Ashorn et al. disclose a recombinant cell expressing a human CD4 protein and a polypeptide which enables T-cell-line-tropic HIV-1 infection. As to claim 13, Heesen et al. and Ashorn et al. also fail to disclose the polypeptide which enables T-cell-line-tropic HIV-1 infection by expression together with human CD4.

Heesen et al. and Ashorn et al. fail to anticipate the present invention as recited in the claims. Withdrawal of the instant rejection is therefore respectfully requested.

**Conclusion**

Applicants respectfully submit that the above remarks and/or amendments fully address and overcome the outstanding rejections and objections. For the foregoing reasons, Applicants respectfully request the Examiner to withdraw all of the outstanding rejections and objections, and to issue a Notice of Allowance indicating the patentability of claims 13, 16, 22, and 24-35. Early and favorable action of the merits of the present application is thereby respectfully requested.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Kristi L. Rupert, Ph.D. (Reg. No. 45,702) at the telephone number of the undersigned below, to conduct an

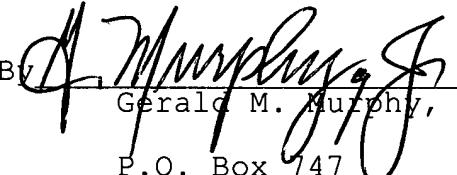
Application Number 09/367,052  
Attorney Docket Number 1422-0386P

interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By   
Gerald M. Murphy, Jr., #28,977  
P.O. Box 147  
Falls Church, VA 22040-0747  
(703) 205-8000

1422-0386P

*KLR*  
GMM/KLR